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USSR Report

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CONTENTS

ATOMIC ENERGY RESEARCH IN BELORUSSIA

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 9, Sep 80 pp 55-57

[Article by V. Nesterenko, Director of the AN BSSR Atomic Energy Institute, and A. Devoyno, laboratory chief and Candidate of Technical Sciences: "The Peaceful Atom"]

[Text] As is generally known, the first atomic reactor in our republic was built and put into operation not far from Minsk in 1962. Nuclear reaction was placed at the service of Belorussian science for the first time. Soon after this the team of young scientist enthusiasts proposed original subjects for investigation which became the basis for the creation in 1965 of the academic Institute of Atomic Energy. The main aim of its activities is the solution of one of the major contemporary problems--the creation of fundamentally new AES's[atomic electric power stations]. The entire course of energy development, particularly the shortage of traditional mineral fuel which is now becoming evident, has dictated this.

New energy sources have special significance in our republic because our fuel energy balance is very strained. The fact is that about 72 percent of our energy resources come from far away. It is economically unwise to plan the further development of the Belorussian power system on organic fuel thermal electric power stations. The way out of this situation is the construction of AES's and heat supply sources. The first step in this direction will be the construction in the 11th and 12th five-year plans of a powerful ATETS[atomic thermal electric power plant]. They intend to use AST's[atomic heat supply stations] for the centralized heating systems of the republic's major cities. They can be located very close to the cities(within 2-3 kilometers) which significantly decreases capital expenditures for heating network construction.

The Institute of Atomic Energy is working closely with Belglavenergo[Belorussian Main Power Supply Administration] and the Belorussian branch of VNIIPIenergoprom [All-Union Scientific Research and Planning Institute of the Power Engineering Industry] in solving these problems. However, our team's main efforts have been directed at solving more long-range tasks. It is known, for example, that an overwhelming majority of the AES's now being created are equipped with thermal(slow) breeder reactors. The next stage in the development of AES's is the creation and assimilation of fast breeder reactors. Work on this complex problem occupies an important place in the activities of the institute's collective.

The following is at the core of the problem. Almost all modern AES's with thermal breeder reactors use uranium-235, which is scarce, as nuclear fuel. It is impossible to effectively use the isotope of uranium-238, which is significantly more plentiful in nature, in thermal breeder reactors. Therefore the general direction in the future development of nuclear energy is the creation of fast breeder reactors permitting the use, specifically, of natural uranium-238. During its retreatment in such a reactor, in addition to the generation of energy, a new fuel--plutonium-239 is built up of which, because of the nuclear reaction, even more is obtained than was used for the initial charging. The accumulated plutonium-239, in turn, can be used as a fuel in second generation reactors. Thus, the technical mastery of fast breeder reactors, thanks to the possibility of using the very plentiful uranium-238 and the production of plutonium-239, significantly(by 30-40 times) increases the potential nuclear fuel resources and permits the broad development of atomic energy.

It is necessary to solve a number of fundamentally new problems during the development and creation of fast breeder reactor AES's. One of them is the selection of a heat carrier--a substance which takes in heat escaping as a result of atomic fuel combustion and carries this heat into the heat exchanger or turbine. Water, which works well in thermal breeders, cannot play this role in fast breeder reactors because of physical reasons. Therefore, liquid sodium is used as a heat carrier in first generation fast breeder reactors(for example, at the Shevchenkovskaya AES and the third power block of the Beloyarskaya AES). However, at the same time the transfer of heat from the nuclear reactor to the steam turbine is difficult and the problem of the reliability of the steam generators arises. To avoid these shortcomings, they are now trying to use helium, carbon dioxide, etc. as a heat carrier.

The Belorussian scientists have gone along another path. For a number of years they have been successfully exploring a fundamentally new heat carrier--dissociating gases. A readily-available, inexpensive chemical product--nitrogen tetroxide, has been chosen. A molecule of this substance, during heating, is broken down (dissociated) into simpler molecules. It takes in sufficient heat at the same time. During cooling the molecules are again united and discharge heat. Thus, dissociating gases are capable of carrying more energy than other heat carriers which permits them, as demonstrated by the institute's work, to make AES heat exchangers which are compact and have less metallic content. Dissociating gas turbines are several times smaller than turbines of corresponding capacity which operate on water vapor. Besides this, a gas heat carrier has a very low induced radioactivity and can enter directly into the turbine from the reactor. This will allow one, during the creation of an electric power station, to manage with one heat transfer circuit instead of the two and three circuits which are now used in AES's. This results in a decrease in capital expenditures for construction.

The institute's collective, as a result of many years of theoretical and experimental study, has elaborated a theory for the use of dissociating gases in atomic power engineering. It has been expounded in 30 monographs and numerous articles, accounts, and scientific reports. The project development of AES's with the new heat carrier has been carried out on the basis of this theory under the scientific leadership and with the participation of the institute in close cooperation with a number of the country's scientific and planning organizations. Specifically, as an intermediate stage on the path toward the planning and construction of large industrial AES's of this type, a draft project of a 300,000 kilowatt experimental industrial

electric power station with a fast breeder reactor and a KNIG-300 dissociating heat carrier was developed. Specialists from Moscow and Leningrad, and from the academies of science of the Ukraine, Moldavia, and Lithuania are actively participating with specialists of our institute in the further development of it already at the technical project level. Friends from Poland, Bulgaria, and Hungary are helping us within the framework of CEMA to create a KNIG-300 AES.

By the way, the new heat carrier studied at the Institute of Atomic Energy of the BSSR Academy of Sciences can also be used in other sectors of industry not directly connected with power engineering. Its introduction saved more than 50 million rubles in 1979-80 alone.

A powerful experimental facility, unique in its make up, was created at the institute to provide scientific and planning development in the area of creating fundamentally new fast breeder reactor AES's. Large-scale research stands, physical reactors, and a radiochemical laboratory have been constructed and are operating on a dissociating heat carrier and the capacity of the first Belorussian atomic reactor IRT [expansion unknown] has been increased from 2,000 to 5,000 kilowatts. An experimental production SKB [special design office], created in 1973, assists in substantially increasing the effectiveness of our work and in speeding up the introduction of research results into the national economy. One can say with certainty that the experimental production institute-SKB system proposed by the president of the Belorussian SSR Academy of Sciences, academician of the Belorussian SSR Academy of Sciences N. A. Borisevich, representing a single, large, scientific-industrial complex, has provided a very fruitful combination of thorough research, scientific and technical solutions and, finally, work on creating AES projects and manufacturing individual equipment units and elements in metal.

The institute is not avoiding today's problems by resolving the long-term atomic power engineering problems. All of the work on introducing gamma-radiation into the technological processes, carried out on a UGU-420 special-purpose gamma-ray source operating on radioactive cobalt-60, deserves attention in the plan. This source was developed and created by the staff members of the institute. Its radiation power is equal to a radiation power of 420 kilograms of radium. Some of the work conducted on this source is for the national economy of the country.

The scientists of the institute together with their colleagues from a number of other NII's [scientific research institutes] of the country and the Belorussian NII of Soil Science and Agricultural Chemistry, and Belgiprobiosintez [Belorussian State Planning Institute of Biosynthesis], in cooperation with the collectives of the Nesvizhskiy Fodder Biomycin Plant and the production association Soyuzbakpreparat [All-Union Association for Bacteriological Compounds], have developed the technology of obtaining from peat a new bacterial fertilizer with nitrogen-acquiring bacteria--rhizotorphine. A radiation sterilization method has been used in its production. Gamma radiation, as much research and experience has shown, destroys the microflora of the peat and permits the obtaining of high-quality rhizotorphine free of foreign micro-organisms. The subsequent intentional injection of nitrogen-acquiring bacteria into the sterile peat creates a new effective fertilizer. It is interesting to note that 200 grams of rhizotorphine per hectare are required to cultivate bean seeds before sowing them. Moreover, there is a 16 to 37 percent increase in the Belorussian harvest.

Most of the rhizotorphine sterilization work is now conducted on a gamma-ray source at the Institute of Atomic Energy of the Belorussian SSR Academy of Sciences, and the injection of nitrogen-acquiring bacteria is done at the Nesvizhskiy Biomycin Plant. Specialists have calculated that the savings from using this innovation to stimulate soy bean growth by utilizing a radioactive sterilization method exceeded six million rubles throughout the country during the years 1976-79. And these are only the first steps in the introduction of the new bacterial fertilizer into agricultural production.

The institute's collective overfulfilled its socialist obligations for rhizotorphine production in 1979-80. More than half a million hectares of bean crops have now been sown with seeds cultivated by it. The construction of a plant for the production of this valuable fertilizer has been started in Nesvizhe.

Research on the radiochemical modification of concretes, specifically on the production of decorative concrete polymers, conducted on a UGU-420 multipurpose gamma-ray source, is of great practical interest. These can be obtained by soaking the surface layer of a solidified concrete matrix with a monomer and polymerizing it by irradiation with ionizing radiation. Mineral dyes are introduced into the concrete mix before it hardens. Then the material obtained is polished and buffed by the usual method. Decorative concrete polymer matches the outward appearance of marble in its broad range of coloring and finish. Its mechanical strength is 3-4 times higher compared with ordinary concrete, and it withstands 300 cycles of thawing-freezing(marble according to GOST/all-union state standard/ withstands 30 cycles).

Decorative concrete polymers can be used for sealing the outer walls of buildings, underground passages, monuments, etc. An experimental industrial batch of this building material was turned over to the Grodnenskiy Oblispolkom for full-scale testing. An overall work program for this task has been worked out and is being examined.

Several studies, conducted on a UGU-420 multipurpose gamma-ray source, have already been completed and have led to the introduction of specific innovations. Thus, based on a process developed at the institute for the radiation gamma-sterilization of medical articles, a republic radiation sterilization center was created and put into operation at the 5th Clinical Hospital of Minsk in 1978. The institute in its order turned over an appropriate irradiator and trained personnel to work on it.

During its 15 years of operation, the institute has grown from a relatively small collective to a large-scale organization with a staff of over 1,500 people. Eight doctors and 74 candidates of science direct the scientific work and 50 graduate students are training for the candidate degree.

Its experimental facility is now being further broadened and upgraded and the working and living conditions of the collective are being improved. A plan, going up to 1990, for the social and industrial development of the institute and the settlement of Sosna, where its staff members mainly live, has been elaborated and approved. The population of this settlement is about 2,000 today. A high school was opened here recently and a new comfortable dining room was turned over to the institute for use.

The institute's collective is full of energy and creative plans. This permits us to say with confidence that it will successfully solve those problems facing it concerning the development of atomic energy and the introduction of nuclear radiation into the national economy.

8524
CSO: 5100

ENERGY CONSERVATION

NEW LATVIAN ENERGY CONSERVATION ASSOCIATION CREATED

Riga SOVETSKAYA LATVIYA in Russian 28 Oct 80 p 2

/Article: "New Association Created"/

/Text/ In July of this year the Latvian SSR Council of Ministers adopted a resolution creating within the system of the Ministry of Municipal Services a republic-level association entitled "Latviyas siltums." Some of our readers have requested us to tell them about the tasks of this association.

At the request of our correspondent, V. Korchagina, Minister of Municipal Services I. P. Berzin talks below about the prospects for developing and improving the administration of centralized heat supply in our republic.

"The creation of the 'Latviyas siltums'" states I. P. Berzin, "will facilitate the regularization of heat supply in the cities and regions of our republic, since the existing structure neither ensures unity of administration nor the promulgation of the appropriate technical policy in this sphere."

As is known, during the last few years our republic's municipal services have witnessed the creation of heat-network enterprises and directorates of combined boiler and heat networks; this has allowed us to raise the level of reliability with regard to furnishing heat to the housing of the local Soviets and other public buildings. During the brief period of their work they have managed to close down 160 small-sized boilers and to reduce the number of service personnel by almost 500.

The newly created "Latviya siltums" Association has been entrusted with functions, the carrying out of which will permit the heat supply of small consumers in our republic to be significantly improved. This association will fulfill the functions of a client with regard to planning, constructing, and modernizing boiler and heating networks, issuing engineering specifications for heat supply and coordinating the future development of a centralized heat supply in cities and urban settlements (except for the

cities of Riga, Daugavpils and Liyepaya), promulgate measures to reduce losses of fuel and thermal energy, and to implement measures to protect the air of the basin.

The association has been created on the basis of the existing 27 heating-system enterprises, which service more than 600 boilers and 400 kilometers of heating networks, as well as a large number of heating complexes. They produce more than 1.5 million gigacalories of thermal energy per year.

This association's imminent task consists of adopting a balance or technically servicing the boilers of non-industrial departments: health care, education, social security, and culture.

Within an extremely brief time period the association must solve the problems of organizing a production center for repairing and adjusting equipment used in thermal electric-power production. This work has already begun, and we hope that in 1981 we will be able to render centralized aid to enterprises.

To a large extent, efficiency within a heating system depends on how many boilers have been furnished with economical technical equipment. With this goal in mind, the Kommunal'nik Test Plant has done a great deal of work on creating and producing high-grade steel boilers to operate on distillate fuel. These boilers have been awarded a Badge of Quality and a certificate from the VDNKh (Exhibition of USSR National Economic Achievements). Tests are now being run on boilers which operate on fuel oil and natural gas. Now in serial production at this plant are installations for the chemical purification of water.

Speaking at the recently held Plenum of the CPSU Central Committee, Leonid Il'ich Brezhnev emphasized that our plans must incorporate a broad program for economizing on fuel and electric power, and so a purposive technical policy must be carried out along these lines. We are profoundly convinced that the measures outlined and being promulgated for creating and strengthening the heating system in our sector will help to solve this problem and already in the imminent future will yield positive results both in the plan for further developing the heat supply of this republic's cities and villages as well as in economizing on fuel and electric-power resources.

2384
CSO: 1822

ENERGY CONSERVATION

INCREASE EXTRACTION OF PETROLEUM RESERVES

Moscow IZVESTIYA in Russian 28 Oct 80 p 2

/Article by R. Bikmukhametov, V. Kozlov, A. Sabirov, special correspondents: "Reserves of a Petroleum Stratum"/

> /Text/ One of the top-priority problems requiring a solution during the next few years is the problem of fuel and electric-power engineering. Although during the last 15 years alone the extraction of petroleum (including gas condensate) has almost tripled, it is still a strain to meet the requirements of the national economy. Speaking at the October Plenum (1980) of the CPSU Central Committee, Comrade L. I. Brezhnev emphasized that the large-scale program of the speeded-up development of Western Siberia's petroleum and natural gas industry ought to become ar extremely important link in the 11th and even the 12th Five-Year Plans. Together with this, our plans should provide for widespread savings of fuel and electric power, which presupposes both a decisive struggle against bad management as well as active solution of the problems linked with a purposeful technical policy. Included among them is the problem of increasing the petroleum yield of strata. How should this problem be solved?

Having visited petroleum industrial sites from Apsheron to Taymyr, from the Carpathians to Sakhalin, we have seen with our own eyes how far people have been led by the untiring search for "black gold." Drilling rigs are springing up on permafrost in the tundra and in the torrid expanses of the deserts, in the trackless remote areas of the taiga and among the raging waves of the sea. The insatiable appetite of modern-day industry for fuel and raw materials demands that newer and newer deposits, hidden in the depths of the earth, be opened up and "unsealed."

Meanwhile, the petroleum industry has a reserve before which the renown of the most famous deposits pales in comparison. This reserve consists in increasing the yield, the performance, of a petroleum stratum.

From its secret depths nature voluntarily yields up only a small token amount of its reserves: approximately one-fourth or one-fifth. Then the pressure within the stratum falls, and the oil "gushers" lose their force. Our scientists proposed to force out the petroleum by means of water.

"Flooding has brought about a genuine revolution in our country's petroleum industry," the renowned petroleum specialist and director of the All-Union Petroleum and Gas Scientific Research Institute, Doctor of Technical Sciences, G. Vakhitov declared in an interview with us. "It is now the principal and, as experience has shown, a highly effective method of working deposits."

"But everything is not so simple here," asserts the general director of the Bashneft' Production Association, Ye. Stolyarov. "The fact is that, as a rule, they send cold water into the earth's depths, and its temperature is much lower than it is in the warm interior. This water cools down the petroleum-containing layers, causes the paraffin to precipitate out, and then a "sclerosis" of the stratum begins. These problems can be solved in only one way--by pumping in hot water."

But where to get so much boiling water? We heard this question from many persons, sometimes posed jokingly, sometimes seriously. Moreover, not from persons standing on the sidelines, but from the petroleum specialists themselves. Nevertheless, the task has been clear for a long time, and there are well-known solutions which permit flooding to be carried out within a sufficiently favorable thermal system. For example, it has long been proposed to inject into the deposits of Tataria water being discharged from the powerful Zainskaya TES (Thermal Electric Power Station).

In addition to the heat from enterprises in the fields of electric power engineering and industry, we should also put thermal underground waters into circulation. We could force them to rise the lower levels into the petroleum stratum by their own flow or, in extreme cases, with the aid of pumps, utilizing the existing operational and injection wells.

Finally, there is the possibility of heating up surface water by means of the Earth's heat, creating a system of special wells. There are also other proposals. Whatever the case may be, it is high time to cease pumping cold water into the interior depths; it often changes from an ally into an enemy. This is particularly important for exploiting the deposits of Western Siberia.

An optimum temperature is an essential but not the only quality affecting the water's capacity to force out the petroleum. If we mix in during the pumping surface-active substances similar to ordinary washing powder, there is an improvement in the washing properties of the water, while with a polymeric additive it becomes thicker and operates more actively within the stratum. Also very helpful are strong "additives" of concentrated acids and alkalis. Mixtures saturated with carbonic acid or carbon dioxide are

effective. Finally, the latest achievement is the so-called micellar flooding. This is a combination method, using special solutions, and promising to bring the petroleum yield up to a level hitherto undreamed of--to 80--90 per cent.

Dozens of experiments are being conducted in various corners of the country. And each one promises a specific kind of efficiency. Sometimes only one ton of an added reagent yields an additional good thousand tons of petroleum. But we still need to make further progress in implementing such innovations and so increase extraction. All the more so since the substances to be used are principally waste-products of the basic production work of various sectors. It is doubly advantageous to utilize them: they do not pollute the environment, whereas petroleum specialists make concrete use of them.

Nevertheless, all these reagents are being utilized in extremely insufficient amounts. Chemists are in debt to the petroleum specialists. Thus, the USSR Ministry of the Chemical Industry has not yet fully put into production dry polyacrilamide for polymeric flooding, while the USSR Ministry of the Petroleum Refining and Petrochemical Industry is also short in producing surface-active substances and test batches of sulfonates.

Let's shift our attention now to Azerbaijan. Its oldest industries have succeeded in reviving once-abandoned wells. They have been aided in doing this by...fire. The process of intra-stratum combustion was first introduced in the area of Khorasana. Special installations make it possible to ignite the petroleum and maintain an underground fire. Heavy-duty compressors, or even gas-turbine engines taken from airplanes, drive air deep underground, thus feeding the flames. Water is also sent down there, and, at the high temperature, it is turned into steam and intensifies the action on the stratum. This original technology is now being mastered by the petroleum specialists of Bashkiria, Tataria, and certain other petroleum-extracting regions. The oilmen of Sakhalin are also adopting thermal methods of affecting a stratum.

Other technologies are also being worked out and applied successfully. However, they are not being disseminated everywhere. One of the reasons for this is a shortage of up-to-date, progressive equipment.

Commissioned by the USSR State Committee for Science and Technology, industry has put into production more than ten types of necessary installations. But much more equipment is needed. For example, there is great need of special heavy-duty compressors and other pumps, but their design has been seriously delayed.

And, of course, the TatNIPIneftemash is the chief organization with regard to developing equipment in order to increase the petroleum yields of strata. It would seem that who else, if not it, should set the tone? However, this Kazan institute could hardly be called an example to be imitated. We visited the area, specified in the plans, where its experimental center was to be constructed and put into operation as early as last year. But all was quite

quiet here. And, therefore, the creators of new equipment have had to get along without making mock-up models, without testing new structural components for reliability.

And here is what has happened because of this. At the Pavlov Gor deposit the Chernomorneft' administrations in the Krasnodarskiy Kray installed and attempted to put into operation the OVG-2 unit for intra-stratum combustion. But it turned out that units of the air coolers were not hermetically sealed, the vibration exceeded the norm and the load-hoisting installations were not at all suitable. In short, dozens of gross technological violations were revealed. But, of course, this installation had been accepted for serial production. One must ask: who needed this "production figure" and for what reason?

More and more such instances of uncoordination in introducing thermal methods are being revealed. This was acknowledged at a session of the scientific and technical council of the Ministry of the Petroleum Industry. How to melt the ice with regard to utilizing heat for extracting petroleum? It is time to arrange matters so that a precise economic mechanism is worked out from the technical assignment and the engineering drawing to the plant assembly and operational testing. The final result of the activity of everybody participating in this process must be the additional extraction of petroleum. And, obviously, everyone must exhibit the same kind of concern as manifested by senior operator of the Tuymazaneft' administration, S. Khalyafeyev, from Bashkiria. To this day, for example, this administration's group well remembers the story about his ordinary student's notebook.

This worker's notes did not constitute a story with a frenetically twisted plot, but ordinary petroleum workers read it in droves. Khalyafeyev's opinions about his work proved to be extremely interesting, and they were reinforced by drawings and formulas. Based on many years of experience, he demonstrated that if one made a thorough study of the nature of each well, the geological properties of the deposit and its operational characteristics, and if one carried out special geological and engineering measures, then one could achieve a tangible increase in the petroleum yield. In the zones serviced by S. Khalyafeyev and his followers every well now yields from one to two additional tons of petroleum per day.

The initiative of this progressive worker has been praised by many operators not only in the Tuymazaneft' but also throughout the entire country. We have often been convinced in various petroleum regions that even under conditions of complicated operations and impoverishment of resources it allows the extraction of additional tens and hundreds of thousands of tons of "black gold."

Nevertheless, there are also quite a few lags in the petroleum industry. It is necessary, therefore, to disseminate workers' initiative even more widely and, what is particularly important, to reinforce it by fundamental

support. Speaking by way of examples, such a notebook as operator Khalyafeyev kept should be kept by every specialist. This will be of specific help to spot future, unused reserves, ways and concrete time periods for their implementation.

What are the principal indicators being used at present to evaluate the activity of petroleum enterprises? There are two of them--volume of extraction and production cost per ton of petroleum. But here in the case of petroleum yield all is not clear. In general, it is still in the planning stage. There is even a term--"reserves to be extracted." They are being determined and confirmed for all deposits. But working out the underground treasures takes a long time, it extends over many decades, and only after the passage of a lengthy period of time can one ascertain what the final petroleum yield is. It is not surprising that it often turns out to be lower than what was supposed.

"In this regard the exploitation of deposits proceeds, one might say, blindly," states the manager of the SibNIPneft' section, doctor of geological and mineralogical sciences, M. Svishchev. "In order that the petroleum-yield indicator work these days, i.e., function constantly and effectively, we must measure its current value."

After lengthy experiments scientists have proposed specific methods for determining the "state of health" of strata. Thus, at the All-Union Petroleum Scientific Research Institute they have established the existence of an optimum speed of movement of the water-petroleum contact, which determines the maximum extraction of petroleum from sections of the stratum into which water is being injected. Radio and electronic specialists of the Kazan State University have created and tested a reliable method for obtaining information about how much the deposit has been drawn down and how much displacement of petroleum by water has occurred in it. This is the wave method.

It is a genuine possibility for providing complete and multifaceted control over the process of working out productive strata and exploiting a deposit. Moreover, it is to be entrusted to computers. However, it is not just a matter of technical solutions. As always, the last word remains to be spoken by the human being who is operating the equipment. Any petroleum specialist, no matter where he may be working and whatever position he occupies, must be vitally concerned with how much more petroleum can be extracted from the depths of the earth. Such a degree of concern is still frequently lacking. The petroleum-yield indicator is now separate from the daily concerns of drilling workers, and it has no effect at all on their economic incentives. And the formation of an enterprise's incentive fund is completely independent of this factor.

"It's time to make monetary incentives directly dependent on petroleum yield," considers the formal general director of the Tatneft' production association, now the chief of Glavtyumen'neftegaz, Hero of Socialist Labor

R. Bulgakov. "Obviously, workers must be encouraged to achieve the planned final petroleum yield of a deposit, as well as, for example, to put the planned capacities into production. And if petroleum is extracted in excess of this level, the enterprise should rightly acquire the differentiated excesses to cover the additional outlays and incentives for extracting these "non-extractable" reserves.

During the last three years, with the application of special methods for increasing the petroleum yield, about six million tons of petroleum were extracted, of which almost one and a half million were in addition to the assigned amount. As specified by the future plans, during the oncoming decade the new methods will be utilized in working out deposits with petroleum reserves amounting to billions of tons. This is a large-scale state task, and its solution is inextricably linked with an increase in the efficiency of utilizing the Earth's depths.

Our country extracts more petroleum than any other country in the world; that is one of the socialist economy's important achievements during the last decade and a half. And now, by increasing the mineral yield, we must develop this achievement and raise the work of the petroleum industry to a qualitatively higher level.

2384
CSO: 1822

CONSERVATION OF FUEL, ELECTRIC POWER FOR WINTER URGED

Moscow IZVESTIYA in Russian 4 Oct 80 p 1

[Article: "Keep Strict Accounts of Fuel and Electric Power"]

[Text] The calendar shows October. Winter is approaching, a time when there is a sharp increase in the consumption of fuel and electric power. An extremely important task at present is to create the necessary fuel reserves at enterprises, to put the energy systems of cities and villages into good order, and to intensify the struggle to conserve on coal, fuel oil, natural gas, and other resources.

And although the extraction of fuel along with the production of electric power is growing at a rapid pace in our country, this does not mean that we can use without a strict accounting kilowatt-hours of electric power, kilograms of fuel oil, or calories of heat. We are proud of the fact that during the 10th Five-Year Plan new petroleum and gas deposits, coal mines, and new electric-power capacities were put into operation.

"But no matter what pace we adopt in developing our energy base," Comrade L. I. Brezhnev has pointed out, "conserving heat and electric power will continue to be an extremely important task for the entire country." Economic managers, Councils of People's Deputies, and organs of people's control on the threshold of winter must intensify their monitoring of the careful expenditure of fuel and electric-power resources; they must hold workers strictly accountable who permit violations of the limits for fuel and electric-power consumption.

This is all the more important inasmuch as the accumulation of fuel at certain electric-power stations is still not proceeding at a rapid enough pace; the coal reserves created up to now are considerably less here than are provided for by the plan. The lag on the part of the USSR Ministry ofthe Coal Industry cannot help but cause alarm. A number of basins have permitted the extraction of even lesser amounts of coal than for the corresponding period of last year. Transportation workers bear their share of the responsibility for the accumulation of fuel in the places where it is consumed. Often that which has already been extracted is not delivered to the consignees on schedule. The Ministry of Railways has not guaranteed the precisely scheduled haulage of Ekibastuz and Kuznetsk coals; the railroads have allowed breakdowns in the train traffic schedules. The same troubles have also occurred

with the deliveries of petroleum and petroleum products, particularly to the oil refineries of Kuybyshevskaya and Permskaya Oblasts, Bashkiria, and others.

Progressive groups in Moscow have come out with a valuable initiative; they have unleashed a struggle for a model preparation for winter. A monthly campaign is conducted here, during the course of which buildings are heated, soft and metal roofings are repaired, and heating ducts are put into good order. The capital has created an integrated system of heat supply, ensuring the minimal expenditure of fuel, the stability of temperature cycles, and the uninterrupted supply of heat to facilities.

It is important that this experience receive wide dissemination. Not only economic organizations but also all Party and Soviet organs--from top to bottom--are called upon to be concerned with fulfilling the planned assignments with regard to economizing on fuel. The Councils of Ministers of the republics and the ispolkoms (executive committees) of the local Soviets must do all in their power to intensify the implementation of measures to cut down losses of fuel and electric-power resources, as well as to put an end to wastefulness. And there are quite a few examples of the latter at enterprises of the Ministry of the Construction Materials Industry, Ministry of Construction, Road and Municipal Machine Building, Ministry of Nonferrous Metallurgy, Ministry of the Chemical Industry, Ministry of the Pulp and Paper Industry, and others. Check-ups have shown that at individual enterprises poor standards have been set for the accounts of fuel utilization; at times specific norms have been established for its expenditure on production output which are higher than those actually attained. Thus, at the Orekhovo-Zuyevsk Stroymashavtomatizatsiya Plant of the Ministry of Construction, Road and Municipal Machine Building no instruments were set to keep account of the gas expenditure, cycle charts were not worked out, and optimum combustion parameters were not specified. All this has led to a loss of approximately 12 percent of the gas being consumed here.

It is impossible to reconcile ourselves with such facts. Party and Soviet organs in the localities must intensify their organizational and political work, directed at increasing the reliability of the national economy's energy provisions, as well as the on-schedule fulfillment of tasks with regard to preparing enterprises and organizations for the winter. Particular attention must be paid to the state of affairs at enterprises which are connected with satisfying the everyday needs of the population during the winter period.

Practically every enterprise has at its disposal possibilities for a more careful utilization of fuel and electric-power resources. But not everywhere are the specified norms being carefully implemented. The preparations by the electric power engineering system for the autumn and winter periods have been poorly carried out; many enterprises of the USSR Ministry of Power and Electrification have delayed in repairing their equipment. Moreover, new capacities at the Smolenskaya and a number of other AES's

(Nuclear Electric Power Plants) are being installed with too many delays. There is not much time left. And so, material, technical and labor resources must be concentrated now on the most important start-up projects in the field of electric-power engineering for the current year. It is also necessary to fulfill all the planned assignments with regard to replacing outmoded, extremely energy-consuming equipment, speeding up technical progress and the widespread application of energy-conserving technology, increasing the thermal insulation of industrial structures and residential buildings.

In a decree recently passed by the CPSU Central Committee attention was drawn to such a reserve as a fuller utilization of secondary fuel and electric-power resources at enterprises of ferrous and non-ferrous metallurgy and the chemical industry. Positive experience in this important matter has been accumulated by groups of the Magnitka, the Volkhovo aluminum plant, and the Novopolotsk Polymer Association, which from the beginning of the five-year plan solely by means of putting secondary energy resources into economic circulation have conserved about 25 million tons of conventional fuel, and today up to 40 percent of the production requirements for heat are covered by these resources. However, the status of this work on the whole in the sectors of the national economy does not meet present-day requirements, and the existing experience is too poorly disseminated.

The ispolkoms (executive committees) of the local Soviets, as well as the people's deputies are called upon to head up the struggle to ensure the steady operation of enterprises and organizations under winter conditions, to meet the requirements of production and the needs of the population for fuel and electric power, to achieve a reduction of their losses, along with a strict observance of the optimum operating cycles and technical discipline. The uninterrupted supply of the country's needs for fuel resources during the autumn and winter period of 1980--81 is an important condition for successfully carrying out the tasks of the culminating year of the present five-year plan and a confident start in the 11th Five-Year Plan.

2384
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SURVEY OF NEEDS TO CONSERVE FUEL, ELECTRIC POWER

Moscow PRAVDA in Russian 28 Oct 80 p 3

[Article: "Conserve Fuel and Electric Power"]

[Text] The survey with the above-cited title (PRAVDA, 26 May) has been examined by the USSR Goskomtsen (State Committee on Prices). A. Diorditsa, deputy chairman of this committee, informs us that, in order to promulgate the strictest possible economies in the field of fuel and electric-power resources, as well as to eliminate unprofitableness in the coal industry, beginning on 1 January 1982, wholesale prices will be raised on coal, petroleum, natural gas, fuel oil, electric power, and thermal energy. The system of new wholesale prices will ensure a more correct price ratio on interchangeable types of fuel. The wholesale prices for industry on various types of fuel for individual zones of consumption are established and calculated in such a way that in regions where coal is mined and the territories adjacent to them there is an incentive to utilize local types of fuel instead of gas and fuel oil.

The new prices will take fuller account of the consumer properties of fuel. Prices will be raised to a greater degree on its higher quality types. In particular, they will stimulate the output of enriched coals and the preparation of petroleum for refining. The wholesale prices on coal are established depending upon its ash and moisture contents, whereas with regard to Donetsk coking coals--upon its sulfur content as well.

Provision has been made for a price differentiation on petroleum depending upon the degree of its preparation at industries and its sulfur content. This will stimulate the separate supply of low-sulfur petroleum, which is in short supply and the resources of which are limited. The wholesale prices on fuel oil are established by zones and calculated in such a way that in no region of consumption will it be cheaper than gas. Furthermore, they are differentiated depending on the sulfur content in the fuel oil and on its viscosity. Prices on coking coal are established at a higher level than those on coals used for electric-power production. Taking into account qualitative indicators and the efficiency of use among consumers, industrial wholesale prices are being raised on individual types of petroleum products.

The new rates for electric power are constructed in such a way as to economically stimulate a reduction in the expenditure of electric power and a curtailment of the peak loads in the electric-power systems.

The authors of the survey "Conserve Fuel and Electric Power" have correctly posed the question of a rational and economical use of fuel and electric-power resources. So the editors have been informed by the deputy chairman of USSR Gossnab (State Committee for Material and Technical Supply), G. Ivanovskiy. As check-ups have shown, economy reserves are still not being fully implemented. Thus, in 1979 check-ups at 476 enterprises of the Ministry of Railways, the USSR Ministry of the Coal Industry, the USSR Ministry of the Construction Materials Industry, the Ministry of the Chemical Industry, the Ministry of the Pulp and Paper Industry of Chemical and Petroleum Machine Building, and other sectors revealed substantial shortcomings, the elimination of which would allow an annual savings of more than 300,000 tons of fuel, 90 million kilowatt-hours of electric power, and two million gigacalories of thermal energy.

USSR Gossnab is preparing measures directed at further improving work on economizing and perfecting the controls over the use of fuel and electric-power resources in the national economy.

The questions raised in the survey concerning the need to modernize power units with capacities of 200,000 and 300,000 kilowatts and the replacement of obsolete condensation turbines operating at pressures of less than 90 atmospheres are urgent. So the editors are informed by the deputy chief of the technical administration of the Ministry of Power Machine Building, V. Goloviznin. In 1980 provisions were made to supply the USSR Ministry of Power and Electrification with parts to modernize six turbines with capacities of 200,000 kilowatts each and three turbines with capacities of 300,000 kilowatts each. The modernization of such power units will be continued during the 11th Five-Year Plan.

As regards the withdrawal from operations of obsolete, poorly economical equipment operating at pressures of less than 90 atmospheres, it is being replaced by the USSR Ministry of Power and Electrification in accordance with the plan assignments. It should be noted, however, the report states, that the planning organizations of the USSR Ministry of Power and Electrification have continued to provide in their plans of electric-power stations for the use of obsolete equipment having lagging specific indicators with regard to metal consumption and fuel utilization. On several occasions the Ministry of Power Machine Building has brought up before USSR Gosplan and the USSR State Committee for Science and Technology the question of ceasing production of such equipment. However, the matter still remains unresolved.

The question raised in the survey concerning the cessation of construction of small-sized boilers deserves particular attention. Industrial boilers are planned and the equipment for them is selected by the planning organizations of various ministries and departments. As a rule, moreover, they

take into consideration only departmental interests and provide for the construction of small-sized boilers with low-productive boiler units. As a result, there has been an increase in the products list of boilers, boiler-auxiliary equipment, means of control and automation. The Ministry of Power Machine Building has addressed proposals to USSR Gosstroy concerning a revision of the products list of steam and water boilers for burning various types of fuel.

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COAL LOSSES FROM RAILROAD CARS ALONG THE TRACKS

Moscow TRUD in Russian 17 Oct 80 p 2

[Article by V. Zhurkin et al.: "Coal to the Winds"]

[Text] We began our "raid" on behalf of fuel economy at the Rasporyaditel'naya Station of the Karaganda Divion of the Alma-Ata Railroad. Empty cars are dispatched from here to many mines in the Karaganda Coal Basin. They return here loaded, are made up into trains, and begin their journies to the industrial centers of Kazakhstan, the Urals, and Siberia. It is precisely from these places--from the coal consumers--that a flood of telegrams arrives. We were shown a thick packet of them, and let's cite a few.

From Kzyl-Orda on the Western Kazakhstan Railroad: "In weighing Car No. 6329696, which was shipped from the Gorbachev Mine, the weight of the coal turned out to be 4,400 kilograms less than that indicated in the documents."

From the Zheneshke Station on this same Western Kazakhstan Railroad, and again with a complaint against the Gorbachev Mine: "In weighing Car No. 6283940, the coal turned out to be five tons less than that indicated in the documents." Here there are also telegrams coming from the following stations: Zhetysu on the Alma-Ata Railroad, Syrdar'inskaya on the Central Asian Railroad. Each of them mentions shortages of from five to ten tons of fuel.

But what is the cause of this?

It frequently happens that an empty car arrives at a mine loading platform with a broken wooden sheathing, bent guard doors, and badly cut hatches.

"It's not the cars but the screens," not without grounds complains the chief of the loading-transport service of the Karagandaugol' Association, A. Polyakov. "And coal is lost through these cracks onto the track being followed."

Urgent measures must be adopted here by workers of the railroad car service. And, of course, the mines ought not to load coal into defective cars.

However, it is not just a matter of the quality of the car pool, but also of the quality of loading. The freight-carrying capacity of a car now in circulation allows coal to be placed into it from the top, with a kind of "cap." Let us note that this coal is quite small-sized. With the present-day train speeds, in order to prevent this "cap" from blowing away, it must be fastened down. A while ago the Karagandinskaya Central Enriching Mill discovered a method for doing this. The surface of the fuel loaded into the cars is compacted with rollers and covered with a special binding liquid. A crust is obtained which prevents the coal from blowing away.

How has the experience of the Karagandinskaya Central Enriching Mill been disseminated at other enterprises in the basin? Not at all. Take, let's say, the Saburkhanskaya Central Enriching Mill. Here they compact the upper layer of the coal with rollers, but they have never even heard of covering it with a binding liquid.

The participants in our "raid" also visited a number of mines. For example, we were at the Toparskaya and Churubay-Nurinskaya. They not only do not use a protective liquid but they do not even roll the coal. And so coal trains rush along the steel main lines, losing thousands of tons of fuel. These losses are constantly growing.

It is well known that the conservation of any valuables depends on how accounts and controls are set up. The following agreement has been concluded between the loading-transport administration of the Karagandaugol' Association and the Karagandinskiy Division of the Alma-Ata Railroad: all fuel loaded into cars must be weighed, and 10% of it is subject to a control re-weighing with the participation of a representative of the railroad station. But how has this worked out in practice? The mines adjacent to the Karabas Station during the third quarter had not furnished a single car with control weights. Less than one percent of all the fuel shipped out was weighed at the Rasporyaditel'naya Station.

"Matters stand the same way in other places as well," asserts the chief of the Karabas Station, I. Zhigulin. "And how could it be otherwise, if out of 16 loading points only four have corrective scales."

All this is costing a great deal: because of its shortages in fuel deliveries the Karagandaugol' Association must pay out to its consumers about a million rubles in fines annually.

Now, when reserves of raw material and fuel are being created for the winter, it is especially important that every link of the loading-transport conveyor function precisely and without the slightest breakdown. The lessons of past years must be taken into account. Every time a frost occurs hundreds and thousands of cars arrive at Karaganda with large remnants of frozen coal; the latter is thrown outside and turns into debris. At the Karaganda-Sortirovochnaya and Karabas Stations we were

told the following: cars are encountered in which the frozen masses of coal amount to as much as 20 to 30 tons.

In accordance with the existing statute, the freight consignees are obliged to clean out the cars completely. But these requirements are carried out at very few places. And the small fine is an empty formality, since it is paid not by the individual guilty party but by the enterprise.

Beginning on 1 October, the mines of the Karagandaugol' Association should have put into operation means to prevent the coal from freezing during hauls. It turned out that most of the loading areas did not have these means. At the Karagandinskiy Metallurgical Combine--one of the largest consumers of fuel--last year were compelled to put into operation a second garage for thawing out coal. But this structure is not ready even now. Unless timely measures are taken, the losses which were permitted during past winters will not be avoided.

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ROLE OF SCIENTIFIC AND TECHNICAL PROGRESS IN SOVIET OIL INDUSTRY DESCRIBED

Moscow NEFTYANIK in Russian No 9, Sep 1980 pp 26-30

[Article by S. Ovnatanov, doctor of technical sciences, professor, and Yu. Simonov, candidate of economic sciences: "Scientific and Technical Progress in the Oil Industry"]

[Text] The system of economic education of the workers that has unfolded in all the production associations of the Ministry of the Petroleum Industry encompasses a broad circle of workers, clerical workers and engineering-technical workers who annually supplement their economic knowledge without interruption from production.

A new course, "Technical Progress and Economics," will be studied in the 11th Five-Year Plan in the system of economic education of the workers. To help those studying this course the journal NEFTYANIK, starting with this issue will print a series of articles according to the standard educational plan prepared by the colleagues of the All-Union Scientific Research Institute for Organization, Control and Economics of the Petroleum and Gas Industry (VNIIOENG). The general editors are deputy head of the planning and economic administration of the Ministry of the Petroleum Industry S. M. Levin and deputy director of VNIIOENG,head of the national university of economic sciences Yu. B. Simonov.

The triumphant development of the Soviet economy turned our country into one of the largest industrial powers in the world. Previously backward Russia whose national production in 1914 was only 4% of the U.S. national product, became a country with a highly developed industry. In volume of production it is literally "on the heels" of the largest capitalist country, and in many directions of economic development already surpasses it. This occurs under a condition where our country developed and is developing based on our own natural resources, while the United States widely exploited and still continues to use the national resources of the countries of Africa, Asia and Latin America. The main funds created by the hands of the Soviet people, the plants and factories, fields, mines and pits, the power engineering plants and communications lines, roads, moorages and transportation, housing and cultural-general facilities, facilities of public health and social security, education, culture and science were estimated at almost 1.7 trillion rubles in 1979 (about half of the main funds of the United States). They annually increase by approximately 100 billion rubles. The volume of the gross social product (GSP) of our country in 1979 roughly equalled 900 billion rubles (over 65% of the GSP of the

United States). Its increase is about R 70 billion per year. The nomenclature of products of all the branches in the USSR national economy includes 24 million types. Its energy raw material branches are developing at accelerated rates: extraction of coal, oil and gas condensate, gas, production of energy, steel, cement, as well as such key branches of the processing industry as machine construction, radio electronics, and chemicals. The 1980 production of electricity will surpass 1.3 trillion kilowatt-hours, extraction of oil and gas condensate--600 million T. Over 400 billion cubic meters of gas will be extracted. Over 160 million T of steel will be smelted and over 140 million T of cement produced. The volumes of machine construction products double every 7-8 years, and of chemicals every 5 years.

At the same time as the rise in the scales of production, with the appearance of completely new branches such as nuclear power engineering, microbiological industry, polymer chemistry, production of electronic computers and many others, there has been a change in the geography of our economy. The northern European section of the RSFSR, Siberia and the Far East, the arid regions of Central Asia and Kazakhstan, and the vast nonchernozem region are being developed at rapid rates. V. I. Lenin once said that the best policy of our party should be concern for the country's economy and all the decisions of the CPSU Congresses are a convincing example of this. The development of the Kola Peninsula, extraction of oil and gas in the Komi ASSR and West Siberia, construction of the Baykal-Amur Mainline, hydromelioration of the fertile lands of Central Asia, and conversion of the virgin lands of Kazakhstan into the country's granary, all of this has entered the consciousness of the Soviet people as proof of the wise policy of our party's Central Committee.

The development of the Soviet economy in the postwar period was accompanied by intensive reconstruction of the national economic structure in order to more fully satisfy the material needs and the cultural demands of the workers. In the last 10-15 years there has been a further redistribution of the personnel working in the national economy between the branches of material production and the nonproduction sphere. As a result the percentage of personnel of the nonproduction sphere in the total number of those working has almost tripled.

In order to support such a rapid development of the traditional and new directions in the national economy the country has trained teams of skilled workers, technicians, engineers and scientists. There are currently about 20 million specialists with secondary special and about 15 million with higher education working in the country's national economy. Roughly half of the specialists in the world, over 1.3 million people engaged in scientific research activity, are specialists in the Soviet Union. Our educational institutions annually train over 2 million skilled workers, over 1 million specialists with secondary special education and about 1 million with higher.

Thus, all the indicators for the development of our country's national economy indicate that this development is intensive (the potentialities for intensive development by increasing the number of workers in the sphere of material production have practically been exhausted). It is occurring as a result of the constant rise in labor productivity which more than doubled in industry alone in the last 15 years. This appears outwardly in the constant "refinement" in the structure of the working population and in the flow of the workers into the more modern branches of the national economy. Thus, the percentage of workers in agriculture in the country dropped from 54% in 1940 to less than 20% in 1979. At the same time the percentage of workers in industry and construction, transportation and communication rose.

But the intensive development of the national economy is possible only on the basis of scientific and technical progress. New machines and mills with programmed controlling devices, new production processes, especially in continuous production, production lines, mechanization and automation of the production processes, introduction of computer equipment into the control of production processes and all of industry, large blocks in construction that turn this process into a highly industrial one, new materials in industry and construction, increase in the unit output of machines, mills and aggregates, and reduction in the percentage of manual and heavy labor are all characteristic features of our time. Scientific and technical progress penetrates all links of the national economy and intrudes into our daily life and even language, bringing to life newer and newer words. The USSR State Committee for Science and Technology controls the process of developing and introducing into the national economy the new equipment and technology.

A general indicator for the stability of scientific and technial progress in the economy of a certain country is the percentage of outlays for the development of science in the gross product of the given country. This percentage is higher in the Soviet Union than in the United States, and considerably higher than in the other developed countries of the West.

Our country's oil industry is no exception. It would have been impossible to guarantee its development to the modern level without the intensive use of the achievements of leading science and technology. These achievements are considerable. It is enough to say that currently two-thirds of the oil and gas condensate is extracted from fields that were discovered in the last 15 years in such new regions of oil extraction as West Siberia and the Komi ASSR, Permskaya and Orenburgskaya oblasts, Mangyshlak, Georgia and Belorussia. These are either distant difficult to reach regions with severe natural conditions (many swamps, long winter with low temperatures, lack of roads, sparse population), or regions with complex geological-technical conditions (deep occurrence of productive levels, high formation temperature and pressure, highly visoous oil, unstable open pits with absorbing levels). Their development in a short time required basically new organizational and scientific-technical solutions in building up the oil fields and the entire region, the operation of the fields with large recoveryof liquid, transportation of large quantities of liquid, recovery of the increased volumes of oil gas, and finally, in the area of production and social infrastructure. The development of all these directions had to be simultaneous and complex. The scientific research and planning organizations of the country are creating new equipment, developing new technology, finding new forms of labor organization, and together with the production associations are successfully introducing them into practice.

The country's oil industry is a complicated national economic complex that includes a number of interrelated processes such as search and exploratory work, building up and development of oil fields, transpor ing of oil to the consumer, and reprocessing of oil gas. It is natural that scientific and technical progress covers the technical, technological and organizational aspects of each of these processes in order to produce the greatest economic effect and the maximum final result.

The last 10-15 years have been marked by a noticeable rise in the scientific and technical level of search and exploration work, including a considerable perfection in the equipment and technology of field seismic work. The equipping of the seismic parties with new equipment, advanced apparatus, the introduction into the practice of field work of more efficient sources for stimulating seismic waves and the use of

computers to process the findings permitted a transition to a basically new method of studying a section, in particular, the method of reflected waves and the use of more efficient methods of research such as the method of common deep point. All of this permitted an increase in the depth of penetration into the earth, increase in accuracy of the information processing, and as a result of this, reduction in the duration of preparation of structures, and improvement in their reliable separation. The confirmability of the structures detected by seismic exploration increased in this time from 50 to 90%. The high reliability of the geophysical studies permitted an almost universal sharp reduction in the structural-exploratory drilling and a transition from geophysical work directly to deep exploratory drilling.

There was a noticeable rise in the scientific and technical level in deep exploratory drilling. The introduction of new drilling units, bits of advanced designs, and washing liquids of better component composition permitted an increase in the commercial drilling rate in exploration from 344 meters per machine per month in 1970 to 411 in 1979, despite the rise in the average depth of the wells by 10%. During this time the duration of well construction was reduced from 485 to 375 days or by 30%.

The scientific and technical progress attained in the search and exploration work in the last 10-15 years allowed the Ministry of the Oil Industry to decrease the duration of field discovery on the average from 15-20 to 7-9 years. During the 10th Five-Year Plan alone 170 fields were discovered; of them 140 were oil, the remaining were oil and gas, gas and gas-condensate. Over 300 new deposits were found on the already known fields. These discoveries occurred in different regions of the country: the outlook was expanded in West Siberia and the Timano-Pechora oil and gas bearing provinces. New data were obtained on the oil and gas content of such oil extracting regions as the Ural-Volga area, North Caucasus, Transcaucasus, Uzbekistan and Turkmeniya.

The achievements of the oil industry are especially great in the area of developing oil fields. This process begins with the drilling out of a field. It includes its building up, extraction of oil and gas and their intrafield transportation, different methods for modifying the bed. It ends with the collection and primary preparation of the oil. As is known, now more than half of the oil and gas condensate is extracted from the fields of West Siberia and the Komi ASSR. Fifteen years ago their percentage in the national extraction was negligible. It is difficult to imagine such a rapid increase here in the extraction of oil without the use of the most advanced achievements of science and technology in drilling out and building up of oil fields, extraction and preparation of the oil and gas, and maintenance of formation pressure. One always has to remember that the fields of West Siberia are located in a swampy locality that was only accessible in winter when the frosts reached 40-45°. The organization of the drilling out of such fields is an exceptionally complicated scientific and technical problem. The usual methods that have justified themselves in other oil extracting regions could not guarantee the rapid industrial development of the province. Therefore the greatest achievement of Soviet science and practice should be considered the development of a method for cluster inclined drilling with special washing bases within which the drilling units are advanced from point to point on special platforms on an air cushion. Up to 20 wells are now drilled in one cluster. The well drilling technology, opening up of beds and development of wells are constantly being perfected. In recent years the branch drilling enterprises have been equipped with Bu-2500EU and Bu-2500DGU drilling units with universal installation capacity, as well as the mobile PP-40Br platforms.

The set of scientific and technical measures taken in drilling in the last 10-15 years sharply raised the level of industrialization of this type of work and in the 4 years of the 10th Five-Year Plan alone permitted a reduction in the duration of th the well construction cycle in operational drilling by 26%. We recall that the decisions of the 25th CPSU Congress provide for a reduction in the 10th Five-Year Plan in the duration of well construction by 25-30%.

On the whole the increase in the rates of exploratory and operational drilling, decrease in the total duration of well construction attained in the last 10-15 years permitted the oil workers to annually conserve no less than R 500 million for the national economy.

The achievements of the oil industry in the area of field build-up are truly revolutionary. In the last 10-12 years the oil extracting regions were technically re-equipped based on complex automation grounded on unified technology of hermetically-sealed operation of the oil fields. The basis for this is block-set automated equipment. The new equipment permitted a radical change in the system of maintaining the field facilities and set industrial construction on industrial rails. The new technical solutions altered the nature and the very content of industrial building: expensive construction work done directly at the fields was replaced by industrial methods of installation and testing of the block equipment of plant manufacture. All of this provides the national economy with an annual saving of capital investments for building up oil fields of about R 1 billion. F. G. Arzhanov, V. I. Grayfer, V. V. Karibskiy, A. V. Sinel'nikov, R. S. Gaynutdinov and V. D. Shashin in 1976 were awarded the Lenin Prize "for re-equipping the oil extracting industry based on new scientific and technical solutions and complex automation that guarantee high rates of growth of oil extraction."

The greatest achievement of our oil science was the development of the principles and working technology for the method of bed pressure maintenance. Its practically universal introduction guaranteed a high level of control over the process of developing the fields, more economical development of the oil regions, and increase in the coefficient of oil output. Intensive scientific research and field work are underway in order to further increase the oil output. This includes the use of such methods as injecting SAS [surface-active substances] and polymers, alkalis and sulfuric acid, and different heat-carriers, as well as the process of intrabed combustion. This work is the specialty of two newly created scientific production associations: "Soyuzneftepromkhim" and "Soyuztermneft'." The efficiency of this set of scientific and technical measures in the area of developing oil fields is estimated at several hundred million rubles.

Pipeline transportation in recent years has been further developed. It occupied the leading place in the country's transport system for hauling oil freight. Whereas in 1969 it was responsible for 39.3% of all the oil freight shipments, last year it was already 54%. This became possible thanks to the considerable growth of the pipeline network. In the last 10 years alone the Soviet Union has built and put into operation about 35,000 kilometers of main oil pipelines, including 15,000 kilometers in the 4 years of the 10th Five-Year Plan. Here the extent of oil pipelines of large diameter is rapidly rising. In the years of the 10th Five-Year Plan alone about 30% of all the oil pipelines in the country were oil pipelines 1020 and 1220 millimeters in diameter. The Soviet Union occupies the leading place in the world for their construction. The volume of transportation work on them currently is over 60%

of the total freight turnover. We will also note that feature of pipeline transportation at the modern stage as the change in the geography of the freight traffic. Whereas previously the main portion of the oil pipelines was in the Ural-Volga region, currently the main oil pipelines have been laid in many economic regions of the country which has permitted the creation of a unified pipeline system.

The set of scientific and technical measures taken in the branch in the last 10 years permitted an increase in the volume of oil pumping on pipelines by 250 million tons. Although the oil extraction during this time doubled, the volume of oil shipments on railroads practically did not increase since the introduction of the pipeline network outstripped the growth in extraction. Since the cost of shipping 1 ton of oil on the railroad is 4 rubles higher than transporting it by pipeline, the national economic effect from replacing the railroad transportation with pipeline transportation reaches R 1 billion per year (without consideration for the economic effect of using the released railroad facilities for other needs).

For many years the recovery of oil gas was the "Achilles' heel" of our country's oil industry. In the last 10 years however a real technical revolution has occurred here as well. Whereas before 1971 the rates of increase in the facilities for refining oil gas that were put into operation lagged behind the rates of increase in its resources, in 1971-1975 they compared with them, and in 1976-1979 sharply surpassed them. The main trend in the construction of gas refining facilities became the use of units and equipment of great unit output, block arrangement of the equipment and light-weight construction elements.

In the 4 years of the 10th Five-Year Plan gas refineries have been put into operation in West Siberia, Belorussia and Kazakhstan. This permitted the total volume of oil gas refining in 1979 to be brought to 19.4 billion cubic meters , and its coefficient of utilization to be increased from 64.9% in 1976 to 69.3% in 1979. For individual oil regions (Tatar and Bashkir ASSR, Kuybyshevskaya oblast) the recovery of oil gas at the beginning of 1980 reached 95-97%. At the same time as the increase in the volumes of oil gas refining there was an expansion in the composition of the removable hydrocarbon components due to the introduction of more advanced technological units and the complete removal of each component was increased.

The increase in the volume of oil gas utilization guaranteed by the set of scientific and technical measures permitted the production of an additional product by more than 150 million rubles.

On the whole the scientific and technical progress in the oil industry that in the last 10-15 years guaranteed its rapid growth and quality reconstruction permitted the country to save annually about R 4 billion, that is a sum equal to the volume of capital investments into the oil industry in 1975.

The successful development of the oil industry, like any other complicated branch of the national economy is impossible without guaranteeing the proportional and balanced development of its individual subbranches. In fact the planned rates of increase in oil extraction should correspond to a certain correlation between oil extraction and the reserves of industrial categories and the output of the oil pipeline system. It should correspond to the volume of commercial oil and

the output of the gas refineries and guarantee complete refining of the oil gas. In precisely the same way within each process proportionality and balance of all types of work should be guaranteed. For example, the potentialities of deep exploratory drilling will depend entirely on the productivity of the exploratory geophysics. The build-up of the oil fields must not lag behind the drilling out. The volumes of water injected into the beds should correspond to the volumes of oil, gas and bed water extraction from them. The power of the oil pumping stations should correspond to the throughput of the pipeline network. The facilities for extraction of any component, for example the ethane fraction, from the oil gas should correspond to the content of the given component in the gas, etc.

Consequently one of the most important tasks of scientific and technical progress in the oil industry is the guarantee of proportionality in the development of its component subbranches. Despite the fairly high level of balance, complete proportionality in the development of all the subbranches, unfortunately,has not been successfully attained yet. For example, the development of search and exploratory work does not match the rates of growth in oil extraction. There is an especially noticeable lag in the construction of facilities for oil gas refining. As a result about 30% of it is still burned in torches. Putting into operation of gas refineries in West Siberia in the next 1.5-2 years will permit a reduction in these losses.

Technical progress depends significantly on the organization conditions under which it occurs. Organization of production in the branch can restrain, or on the contrary, stimulate it. In the oil industry back in 1965 a noncorrespondence was found between the technical level of production and its organizational structure. In order to eliminate this inconsistency the Ministry of the Petroleum Industry made a decision to intensify scientific developments in the area of organization and control. For this purpose a special institution, the All-Union Scientific Research Institute for the Organization, Control and Economics of the Oil and Gas Industry (VNIIOENG) was set up that year. The general plan for control of the branch that it developed permitted its radical reconstruction by 1975, starting with production and ending with the central apparatus of the ministry.

The branch reconstruction was based on deep specialization of production, in particular, specialization of oil extraction, drilling, construction and transportation servicing, repair servicing and material-technical supply. The functions of control in the oil and gas extracting associations and in the ministry were brought into correspondence with the organization of production. The status of the oil and gas extracting associations was changed: they became association-enterprises with all the functions and rights following from this. The organization of branch science also underwent changes: in particular, specialized branch scientific research institutes and complex territorial scientific research and planning institutes were set up.

The organizational reconstruction of the branch intensified scientific developments and promoted their most rapid introduction into production. Simultaneously it created favorable conditions for the introduction into the system of production control of the most efficient control methods. The last 10 years were years of the energetic introduction of computer technology into the branch. Currently the oil industry belongs to those branches that are the most equipped with modern computers: they are practically in all the institutes, in the majority of production associations, in many administrations of main oil pipelines, and in almost all the geophysical trusts.

In the last 5-7 years the branch has significantly improved the scientific method and practical work in the field of planning. According to the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Intensifying the Effect of the Economic Mechanism on the Increased Efficiency of Production and Quality of Work" the branch has developed a coordination plan of work for perfecting the entire system of planning. It provides for the creation of method and instructive materials, standards of labor, monetary and material-technical outlays, an automated system of planning calculations (ASPR) and complex target programs for the branch development.

The work that has unfolded in accordance with the decree of the CPSU Central Committee and the USSR Council of Ministers for perfection of the entire system of control of the branch created favorable conditions for further development of scientific and technical progress in the oil industry.

9035
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HIGH-POWERED ELECTRIC MOTORS USED IN OIL INDUSTRY EXTOLLED

Moscow PRAVDA in Russian 4 Sep 80 p 2

[Article by V. Kremnev, First Deputy Minister of Petroleum Industry: "They Have No Equals"]

[Text] The development of pipeline transport and the intensification of oil recovery by the maintenance of reservoir pressure have required especially powerful electric drives. STM-series synchronous electric motors had been used for these purposes. Their use helped to raise the power factor of electrical installations, stability of the power supply, and productivity of the pump units. Synchronous motors, like synchronous compensators, are capable of generating reactive energy and feeding it to the power grid. Consumption from the power system is thereby reduced.

However, the STM's bulkiness and great weight prevented its wide introduction. That is why the collective of the Lys'va Turbogenerator Plant, in collaboration with scientific-research institutes and interacting with Minneftеprom [Ministry of Petroleum Industry], undertook to develop a new series of synchronous three-phase motors--the STD's. The creative study of the designs bore good fruit: the dimensions and weight of the machines were reduced by one-third to one-half, while efficiency was raised 0.5-2 percent. This became possible thanks to the use of a number of inventions. Just one of them, which improved the rotor, yielded more than a million rubles in annual savings.

With the introduction of this series of motors, the oil industry obtained a reliable and economical electric drive that has no equal in the country or abroad. All the largest trunk oil pipelines are equipped with them. Ninety percent of all the country's oil is moved with the use of STD-series electric motors.

In oil recovery, they turn the pumps that inject water into oil deposits for purposes of maintaining reservoir pressure. This year they enabled more than 600 million m^3 of water to be injected into the productive stratum. Their compact design and light weight have made it possible to modularize pump units and to dispense with the regular reinforced-concrete footings, which were restricted by the pipe-type piling. This enabled the manufacture and erection of modules for cluster pump stations to be put on an industrialized basis, capital expenditures to be reduced, and introduction of the facilities to be speeded up.

Operational experience has shown that the technical level of the STD-series electric motors exceeds considerably the indicators of similar machines of well-known companies of a number of countries, including the FRG, Sweden and Japan. Moreover, this series includes a multitude of modifications of motors with capacities of from 630 to 12,500 kw--76 types. Machines based on 6 and 10 kV of identical capacity have one and the same size, which is very important for customers who have electric-power grids of different potentials at their disposal. The motors are started without any kind of starting devices--by direct connection to the grid, and they require a minimum of time for preparation for operation and for technical servicing. With reduced dimensions and weight, the motors permit a prolonged overload by 15 percent of real power. The STDP series, which is based upon the STD series, has been developed and mastered in production for use in an environment of explosive hazards. These motors are installed in the same room with oil pumps without any kind of partition and are used to drive compressors at gas-treatment plants.

More than 3,200 series STD motors, totaling about 9,000 Mw in capacity, are now operating in the oil industry. Since their introduction in 1979, they have saved 10 million rubles, thanks alone to a reduction in operating costs, primarily because of reduced demand for electric power as a consequence of higher efficiency. Moreover, wide use of these machines in the ramified oilfield electric-power grids and at oil-transfer pump stations has substantially raised the reliability of the electric-power supply--the voltage is maintained at the prescribed level directly at the load units by means of a high-speed automatic system of excitation that is supplied by the plant along with the electric motor. This has enabled reduction of expenditures for the construction of high-voltage LEP's [electric-power transmission lines], and in some cases it has done away with the installation of synchronous compensators and batteries of static capacitors.

Designers and operators get from these machines compactness, convenience in transport, simplicity of servicing, and reliability and economy. Work has started to promote the motor's merits in the competition for the USSR State Prize.

11409
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AZERBAIJAN'S RECENT OIL-EXPLORATION EFFORTS CRITICIZED

Baku VYSHKA in Russian 12 Sep 80 p 2

[Editorial: "Exploration for Oil"]

[Text] Among the knotty problems of further developing the economy, the 25th CPSU Congress and subsequent party decisions set forth the task of rapidly developing the fuel complex. Successful solution of this task depends greatly upon the pace and quality of prospecting for new oil and gas fields and areas.

Azerbaijan's explorers for minerals are making their contribution to development of the country's fuel complex. In recent years they have discovered a number of fields of liquid and gaseous fuel, both on land and at sea. Explorers for offshore oil have achieved especially noteworthy feats. Last year they discovered the promising Field imeni 28 Aprelya in the Neftyanyye Kamni region, and recently proved the presence of oil in the seventh level of the productive layer in the southwestern wing of the Bulla Island area.

The explorers' successes are indisputable. However, beyond them, it is impossible to overlook serious deficiencies in the organization of geological exploration. For many years now the plan for exploratory drilling and for growth in industrial oil reserves has not been met. It is this that explains the tense situation that has prevailed in the republic over the recovery of liquid fuel.

There are many factors that explain the lag in exploration. One and, perhaps, the main one, is low speed in drilling holes. It is impossible to consider normal the fact that in Azneft' [State Association of the Azerbaijan Oil Industry], for example, it takes 3 or 4 years to drill an exploratory hole less than 4,000 meters deep. A high accident rate continues to exist. In the preceding 8 months of this year 7 serious accidents occurred in exploratory drilling in Azneft', while in Kaspmorneftegazprom [Association of the Caspian Offshore Oil and Gas Industry] there were even more--9. Many holes that were not carried out to completion of their geological tasks are being eliminated for so-called technical reasons. There is something left to be desired in organizing work and in the status of production discipline. Analysis indicates that the causes of many accidents and much nonproductive idle time are to be found in the violation of elementary drilling technology requirements by drilling brigades.

Each year the conditions for underground exploration become more complicated, the drillers are working in new regions, and well depths are increasing. At the same

time, questions of a first-priority and stable supply of material and equipment resources to the oil explorers, supplying them with modern equipment for mastering great depths, and the buildup of the fields are not being resolved energetically enough. The exploration of oil deposits in Muradkhanly, in particular, has been going on for many years now, yet interruptions in the power supply, which hamper the wide introduction of progressive technology for sinking wells, are still being observed. Roads and other service lines are being built poorly and slowly. Work ceases completely at some exploration sites during rainy weather because of a lack of real roads. Not by far have enough good living facilities been built everywhere yet for the drillers.

During the July 1980 plenum of the Azerbaijan Communist Party Central Committee, after we discussed the tasks of the republic's party organization for a proper greeting for the 26th CPSU Congress, the necessity to take active measures to overcome lags in the oil industry was emphasized. It is the duty of party and trade-union organizations and of economic leaders to pay the most serious attention to improving the state of affairs in exploration and to raising geological exploration effectiveness as a first-priority prerequisite for a boost in oil recovery. Primarily, of course, the main human and technical resources should be concentrated in the promising directions of exploration, from which rapid and effective results can be expected.

There are, within the great detachment of glorious explorers of Azerbaijan's depths, no few remarkable masters of their jobs, whose rich experience will show what great reserves are at the disposal of the republic's oilworkers for accelerating the pace of sinking exploratory holes. Take, for example, the brigade under Said Guseynov from the Bulla MURB [offshore drilling administration]. This explorers' collective, one of the republic's initiators of workers' competition for a proper greeting for the 26th CPSU Congress, which drilled a hole 6,203 meters deep under complicated conditions, with a record speed of penetration of 500 meters per rig per month.

All explorers of the deep can and should drill holes this way. But for this to be done, party and trade-union organizations must be concerned about wide propagation of advanced experience and about equipping each worker with innovative work methods.

From day to day the competition for a proper greeting to the 26th CPSU Congress is being expanded. It is the duty of explorers of the underground to lift high the banner of the precongress competition, to greet the forum of the country's communists with good labor deeds, with successful fulfillment of the plan and of the commitments that have been adopted.

11409
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NEW COAL MINE OPENS IN DONBASS

Kiev UGOL' UKRAINY in Russian No 9, Sep 1980 pp 5-7

[Article by Mine Director R. F. Bulatov: "New Leninskiy Komsomol Ukrainy Mine Becomes Active"]

[Text] The "Zapadno-Donbasskaya" mine No 16/17 of the association Pavlogradugol' (first phase) was put into operation in December 1979. It was built as an all-union shock-worker komsomol project. The mine has been awarded the honored name of the Leninskiy Komsomol Ukrainy.

The mine construction project was developed by Dneprogiproshakht. The annual rated output is 3 million T of coal with simultaneous operation of two units with load of 1.5 million T each. Stripping is planned on 7 working beds (c_{10}^{6}, c_{8}^{6}, c_{8}^{M}, c_{7}^{M}, c_{6}^{B}, c_{5} and c_{1}) with thickness from 0.63 to 1.07 m and total industrial reserves of 185.7 million tons. Two adjacent beds c_{8}^{B} and c_{8}^{M} with interstratum of 6-7 m will be worked in block No 1 that has been put into operation (in an inclined field in the direction from the shafts to the boundaries of the unit). The beds are dangerous due to dust explosiveness. The mine belongs to the category of super methane abundance.

The surrounding rock is mainly argillite and aleurolite of low and average stability that are prone to swelling and soaking. Sandstone with interstratifications of coal is traced less often. The rock bed is gently sloping (angle 3-5°).

The opening up and stripping of the mine field is by the block method with isolated aeration of the blocks. The vertical centrally paired shafts of block No 1 7.5 m in diameter were made to a depth of 700 m. The main shaft is equipped with double-skip coal and single-skip rock lifts. The load capacity of the skips (during operation of the first phase of the mine) is 19 and 16 T respectively. Multiple-cable lifting machines TsSh-5x4 and TsSh-4x4 have been installed on the tower headwork. Their distinguishing feature is that they are equipped with drives with nonreversing thyristor transformers and a unified block system of regulation.

The auxiliary shaft that is equipped with a double-cage lift and a single-cage with counterweight is for lowering and lifting people, material and equipment, as well as for feeding fresh air into the mine.

A panel preparation plan is used (fig 1). Panel haulage and conveyer galleries have been made from the bed near the shaft at the 480 m level over bed c_{8}^{M}, and drainage galleries from the haulage crosscut at 585 m level at the lower boundary. The panel and drainage galleries are common for bed c_{8}^{B}. Excavation galleries

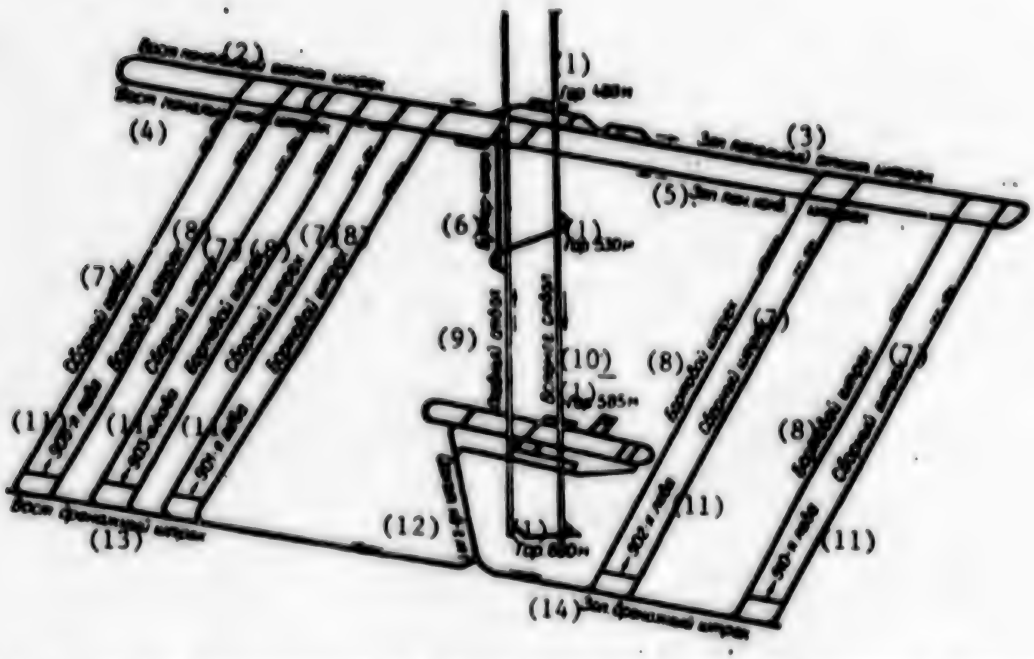

Figure 1. Plan for Preparation of First Phase of Leninskiy Komsomol Ukrainy Mine

Key:

1. Level
2. Eastern panel haulage gallery
3. Western panel haulage gallery
4. Eastern panel conveyer gallery
5. Western panel conveyer gallery
6. Accumulating bin
7. Collecting gallery
8. Border gallery
9. Main shaft
10. Auxiliary shaft
11. Longwall
12. Haulage crosscut No 1
13. Eastern drainage gallery
14. Western drainage gallery

(conveyer and freight-people) pass between these drifts and outline the descent shafts. The gallery (length of the shaft) is 1300-1600 m long and the longwall is 170 m long.

The working system consists of long shafts with excavation on the rise in single longwalls. There is separate stripping of the beds within the section. As the longwalls of the upper bed are stripped, the longwalls of the lower are put into operation with further advance of extraction work on bed c_8^8. All the drifts, except those near the shaft are secured with metal arched timbering made of special profile SVP [expansion unknown] with reinforced concrete tie bars. The panel haulage and conveyer galleries have an inside area after settling of 13.1 m^2, while the drainage galleries and crosscuts have no less than 9.5 m^2 with distance between the frames of 0.5 m. The construction of the drifts successfully employed advanced methods of increasing their stability: the securing space was strengthened by injection of a sand-cement mortar (plug), underpinning of the opposite arch with foundation beams made of special profile was used, and new methods and combinations were introduced for strengthening the metal arch timbering with concrete.

The excavation galleries with area of 8.2-10.2 m^2 were strengthened on the inside with arches (every 0.7 m) and support elements under the timbering posts. The experience of tunneling and timbering accumulated by the mine builders is taken into consideration and employed by the tunneling brigades. At the mine the drifts are made by 4PP-2 and GPK combines. The tunneling brigades of V. K. Kozachenko, A. V. Putri, A. N. Nazmutdinov and N. A. Astakhov are systematically mastering the new mining equipment. Two specialized brigades have been set up to finish the junctions and to do the plugging work. According to the plan the tunnelers will make 7460 m of stripping and preparatory drifts in 1980.

According to the plan the breakage faces should be equipped with coal-extracting complexes KD-70. Since they are lacking, the longwalls are equipped with mechanized timberings "Donbass," narrow-range combines MK-67 and SP-63 m conveyers. For this reason the cutting of border rocks in thin bed c_8^6 has been increased 4-fold as compared to the plan, and the ash-content of the extracted coal has doubled. In order to reduce such a negative factor MK-67 m combines and SP-48 m conveyers have been installed in the two longwalls. It is planned to use them to reduce the cutting of border rocks roughly by 100 mm. At the same time work is being boosted to prepare and introduce two longwalls on the thicker bed c_8^n. There are currently five extracting sections at the mine. Yet another longwall is being prepared for assembly. At block No 1 the number of sections for extraction will be increased in the future to eight.

During tunneling of the excavation galleries with lower undermining alone, due to the unstable rocks the drive heads of the conveyers cannot be projected into the galleries. Excavation of the upper and lower niches 7.2 m long each still remains the most labor-intensive operation in the longwalls and a delaying factor. A search is being made for the optimal solution to this complicated problem in order to diminish the labor-intensity of the work.

The extracting sections headed by V. I. Kozhukh, G. A. Strelenko and V. Ya. Oleynik are successfully coping with the set tasks to increase the load on the breakage face, thus providing extraction of up to 500 T of coal per day.

The problem of complete conveyerization of transportation has been solved on a high engineering level. The coal is transported by belt conveyers from the breakage faces to the accumulator bin at the main shaft. 1LT-80, 1L-80 and 2L-80 conveyers have been installed in the excavating galleries, and 1L-100K and 2LU-120 conveyers in the panel galleries. All the conveyer posts are suspended from the tops of the gallery timbering for convenience of maintenance and repair. The presence of a coal accumulator bin at the shaft with holding capacity of 500 T considerably reduces the effect of the nonuniform arrival of loads.

Locomotive transportation at the levels delivers people, materials and equipment, and transports rock from the drift tunneling. Electric locomotives AM-8D and VG-3.3 cars are used. Both levels are equipped with dumpers and loading garages. Monorails 6DMK are installed in the excavation galleries for delivering people and materials to the longwalls.

In accordance with the prediction the gas-bearing content of the coal is 9-25 m^3/T. The plan provides for aeration of the mine with VRTsD-4.5 fans. The aeration plan of the excavation sections is return-flow with freshening of the outgoing stream and its outlet to the area. The fresh stream enters on the border galleries to the

longwalls, while the outgoing travels on the collecting galleries to the panel conveyer galleries. The freshening stream is fed from the drainage galleries through the collecting galleries that are maintained in the worked space. In addition degasification of the accessory beds is provided for by wells drilled from the border galleries. Vacuum-pumps DVVN-150 are installed in the surface pumping station.

The relatively high gas abundance (for the mines of West Donbass) advances a number of problems that require resolution. Since there is not enough experience of conducting degasification work in the given mining-geological conditions, the well drilling parameters require refinement. The experience of the first period of mine operation raises doubts as to the expediency of the adopted plan of ventilation with freshing from the worked space, and especially outlet of the outgoing stream of the mine on the drifts where the belt conveyers are. This is governed by the significant difficulties in maintaining the section galleries, and first of all the low efficiency of the plan. The outlet of the outgoing air stream on the panel conveyer galleries with great velocity complicates the maintenance of the mechanisms and work to wash the drifts and conveyers. This has a negative effect on their condition (swelling of the ground from soaking and corrosion of the metal due to the high aggressiveness of the water). The removal of the outgoing stream (on the connector where the 1LU-120 conveyers has been laid to the accumulator bin) to the main shaft is unsuccessful. The high speed of the air stream has an especially adverse effect on the operation of the flat balancing cables of the coal skips. It is evidently necessary to have ventilation drifts parallel to the panel conveyer galleries designed to remove the outgoing air stream. The question of the removal of the outgoing stream into the main shaft where the balancing cables are requires a special approach and solution.

The plan of the mine surface is distinguished by compactness. However the dimensions of the material storehouse (24 x 16 m), the storehouse of fuel and lubricants (12x6 m) and the car repair workshop (10x8 m) are insufficient even for a small enterprise. A garage has not been provided for the lift trucks, service transport and their repair. It has become necessary to plan and construct a surface compressor station for elimination of the surface compressor units.

Work is currently underway to introduce an ASU TP [automated control system transformer station], to organize the industrial area, auxiliary buildings and administrative-general kombinat. It is planned to introduce the second phase of the mine in 1986. It is planned to increase the volume of housing construction. In the next 2-3 years a hospital with polyclinic, children's preschools,a club and pioneer camp will be built.

The miners of the Leninskiy Komsomol Ukrainy mine, having supported the initiative of the leading collectives of the enterprises to start a shock labor watch in honor of the 26th CPSU Congress have adopted increased socialist commitments that plan for new frontiers in increasing the coal extraction and mastering the rated output of the new mine. The collective is exerting all its efforts to fulfill the large tasks facing the miners, and to worthily meet the 26th CPSU Congress and the 26th Congress of the Ukrainian Communist Party.

9035
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UKRAINIAN COAL OUTPUT RESULTS FOR FIRST HALF OF 1980 REPORTED

Kiev UGOL' UKRAINY in Russian No 9 80 pp 45-46

[Article: "Ukrainian SSR Coal Industry in First Half of 1980"]

[Text] The collectives of the production associations Donetskugol', Dobropol'yeugol', Artemugol', Ordzhonikidzeugol', Shakhterskantratsit, Torezantratsit, Voroshilovgradugol', Krasnodonugol', and Pavlogradugol' have fulfilled the plan for coal extraction in the first half of the final year of the 10th Five-Year Plan. Many leading mines, sections and brigades have reported early completion of the five-year plan assignments for fuel extraction. The brigades who extracted 1000 T of coal and more per day, and the tunneling brigades who are working on a high-speed schedule have labored successfully.

Not all the associations, however, have coped with the set assignments for coal extraction. On the whole for the Ukrainian SSR Ministry of the Coal Industry the extraction of coal in the first half of 1980 was 100.86 million T (99.6% of the plan).

In the coal industry of the republic as of 1 Jul 1980 there were 1,703 active breakage faces (table 1). The average active line of breakage faces was 257.52 km, the monthly average advance of the active breakage faces was 33.7 m, and the daily average extraction for one longwall was 337 T.

In the final year of the five-year plan a lot of attention is being given to the technical progress in the mines and open pits, in particular, complex mechanization of the production processes. Thus, the number of complex-mechanized longwalls rose from 574 in the first half of 1979 to 610 in the first half of 1980, or by 6.3%. This includes from 518 to 546 in the beds with angle of incline up to 35°, and from 56 to 64 in the beds with angle of incline over 35°. Coal extraction from the complex-mechanized breakage faces on the beds with angle of incline up to 35° was 50.61 million T, or 61.6% of all the extraction from these beds (table 2). The daily average load on the longwall was 582 T. On the inclined and steep beds the coal extraction from the complex-mechanized breakage faces reached 1.75 million T with a daily average load of 182 T of coal. From the 74 graded longwalls in the beds with angle of incline up to 35° 3.12 million T of coal were extracted with a daily average load on the face of 261 T.

The tunneling indicators for the preparatory drifts are presented in table 3. The plan for making all preparatory drifts for the Ukrainian SSR Ministry of the Coal Industry was fulfilled by 100.6%. There were 8.9 km of drifts made above the plan.

Table 1.

Production associations	Coal extraction thous.T	Number of active breakage faces	Average active line of breakage faces, km	Average monthly advance of active breakage faces, m	Daily load, T on active face	Daily load, T on mine-open pit (adm.un.)
Donetskugol'	10 836	188	34,50	28,6	333	2974
Makeyevugol'	7 788	143	21,97	29,3	299	2912
Krasnoarmeyskugol'	6 323	80	13,20	40,3	466	3448
Dobropol'yeugol'	5 623	43	7,68	61,3	636	3629
Artemugol'	5 659	225	33,61	29,4	143	2122
Ordzhonikidzeugol'	2 982	99	11,11	29,7	160	1755
Shakhterskantratsit	5 758	104	18,69	28,5	318	1824
Torezantratsit	5 634	98	15,17	30,3	328	1985
Voroshilovgradugol'	5 688	75	12,13	36,9	435	2868
Stakhanovugol'	4 351	120	18,48	24,1	214	1511
Pervomayskugol'	4 175	82	15,43	24,3	280	1550
Krasnodonugol'	4 415	58	8,03	44,1	444	2707
Donbassantratsit	10 751	160	27,13	31,4	378	3653
Sverdlovantratsit	4 241	41	6,57	49,1	668	2911
Pavlogradugol'	5 392	65	9,89	63,6	518	3187
Ukrzapadugol'	7 438	102	13,00	46,2	699	3086
Aleksandriyaugol'	4 310	18	0,97	84,8	771	3653
Ukrainian SSR Ministry of the Coal Industry	100 864	1703	357,82	28,7	337	2418

Table 2

Production associations	Complex mechanized faces equipped with combines and graders on beds with angle of descent to 35°			
	Number	Extraction thous. T	Level %	Load on longwall, T per day
Donetskugol'	—	—	—	—
Makeyevugol'	46	4700	64,9	575
Krasnoarmeyskugol'	37	3510	82,9	635
Dobropol'yeugol'	56	4220	73,8	490
Shakhterskantratsit	30	4482	85,6	981
Torezantratsit	20	1671	29,9	488
Voroshilovgradugol'	47	3456	67,9	447
Stakhanovugol'	29	3047	61,6	638
Pervomayskugol'	16	967	28,5	349
Krasnodonugol'	18	1081	30,3	422
Donbassantratsit	32	5318	90,7	650
Sverdlovantratsit	50	4768	49,6	638
Pavlogradugol'	36	3826	95,4	670
Ukrzapadugol'	57	4753	93,8	544
Aleksandriyaugol'	62	5485	77,8	617
	12	1298	100,0	771
Ukrainian SSR Ministry of the Coal Industry	548	80610	61,8	582

Table 3.

Production associations	Making of preparatory drifts					
	all			stripping and preparatory		
	Plan, km	Act. km	% of plan	Plan, km	Act. km	% of plan
Donetskugol'	148.0	152.2	102.8	107.8	109.1	101.5
Makeyevugol'	111.4	111.8	100.4	78.7	78.7	100.0
Krasnoarmeyskugol'	83.6	76.7	92.0	71.9	63.6	88.5
Dobropol'yeugol'	92.3	101.5	110.0	62.6	62.9	100.5
Artemugol'	182.1	183.4	100.8	82.3	84.0	102.1
Ordzhonikidzeugol'	62.5	65.7	105.1	36.6	36.7	100.3
Shakhterskantratsit	76.7	75.2	98.0	51.2	50.3	96.3
Torezantratsit	65.1	67.6	103.8	43.1	44.4	103.2
Voroshilovgradugol'	85.6	86.1	100.6	50.8	50.8	99.6
Stakhanovugol'	101.4	102.3	100.9	60.3	60.4	100.2
Pervomayskugol'	81.0	74.2	91.6	57.7	52.8	91.5
Krasnodonugol'	61.1	61.1	100.0	41.8	39.5	94.5
Donbassantratsit	134.6	140.0	104.0	76.3	76.2	99.9
Sverdlovantratsit	54.4	53.5	98.3	36.7	35.8	97.4
Pavlogradugol'	64.3	63.2	98.3	60.7	59.1	97.4
Ukrzapadugol'	69.3	67.9	98.0	58.5	57.7	98.6
Aleksandriyaugol'	15.1	14.9	98.7	14.0	13.5	96.4
Ukrainian SSR Ministry of the Coal Industry	1468.4	1477.3	100.8	988.7	973.9	98.5

Table 4.

Production associations	Making of preparatory drifts with mechanized loading				
	Plan, km	Act. km	% of total length of drifts where loading required	by combines	
				Plan, km	Act. km
Donetskugol'	118.3	120.1	78.9	43.1	41.9
Makeyevugol'	78.9	79.1	73.8	27.4	27.9
Krasnoarmeyskugol'	63.6	59.5	77.6	23.4	21.7
Dobropol'yeugol'	88.4	98.9	96.5	64.4	69.4
Artemugol'	80.3	80.3	100.0	4.9	3.8
Ordzhonikidzeugol'	34.6	33.4	91.5	0.7	0.1
Shakhterskantratsit	48.8	48.7	65.9	14.8	13.6
Torezantratsit	41.7	43.9	66.8	4.4	2.8
Voroshilovgradugol'	60.3	62.0	79.5	14.1	13.3
Stakhanovugol'	69.5	68.6	80.5	2.0	2.1
Pervomayskugol'	50.1	44.4	62.6	8.8	3.3
Krasnodonugol'	41.1	39.6	81.3	13.1	8.4
Donbassantratsit	69.2	69.2	56.5	5.2	4.8
Sverdlovantratsit	35.8	36.0	67.3	0.9	0.6
Pavlogradugol'	61.5	61.5	97.6	58.1	58.1
Ukrzapadugol'	57.2	54.5	80.3	36.0	31.9
Aleksandriyaugol'	12.7	11.7	78.5	12.7	11.7
Ukrainian SSR Ministry of the Coal Industry	1012.0	1013.4	77.8	334.0	315.2

Table 5.

Production associations	Processing of run-of-mine coal on breakage face, thous. T	Output of concentrate, thous. T	Yield of concentrate, %	Output of large-average types, thous. T	
				coal	anthracites
Donetskugol'	1 273,5	390,1	30,6	282,9	—
Krasnoarmeyskugol'	301,4	224,1	74,4	64,9	—
Dobropol'yeugol'	433,9	228,8	52,7	55,6	—
Shakhterskantratsit	2 018,9	840,0	41,6	—	1000,2
Torezantratsit	5 400,3	2 345,9	43,4	—	1885,5
Donetskugleobogashcheniye	25 699,3	17 757,6	69,1	920,5	537,2
Pervomayskugol'	1 647,3	711,4	43,2	711,4	—
Donbassantratsit	10 710,0	5 130,9	47,9	—	3766,1
Sverdlovantratsit	2 865,4	1 149,4	40,1	—	1149,6
Voroshilovgradugleobogashcheniye	12 748,8	8 541,6	67,0	342,7	—
Pavlogradugol'	1 600,3	976,7	61,0	349,3	—
Ukrzapadugol'	1 000,0	668,6	66,9	289,8	—
Ukrainian SSR Ministry of the Coal Industry	65 699,1	38 965,1	59,3	3017,1	8338,6

The plan for making stripping and preparatory drifts was mastered by 98.5%. The plan for making preparatory drifts with mechanized loading of coal and rock was fulfilled by 100.1%. Drifts of 1.4 km above the plan were made (table 4). This was 77.8% of the total volume of drift-making where a load is required. The results of work by the coal enrichers of the republic are presented in table 5. The enrichment plants of the Ukrainian SSR Ministry of the Coal Industry in the first half year processed 65.7 million T of coal, made 38.96 million T of concentrate, and produced 11.36 million T of coal of large and average classes, including 8.34 million T of anthracites. The units of mechanized rock-sorting processed 5.06 million T of coal, or 103% of the plan. The plan for production of coal briquets was fulfilled while the plan for production of lignite briquets was underfulfilled.

The leading extracting and tunneling brigades labored successfully in the first half of the year: 104 brigades guaranteed a load on the longwall of 1000 T of coal and more per day, and 212 collectives tunneled drifts at high rates.

In the socialist competition for the successful fulfillment of the assignments of the final year of the 10th Five-Year Plan new labor achievements were made by the following brigades: V. G. Murzenko from the mine "Krasnyy partizan" (hoisted coal in the first half year of 654,100 T with a commitment of 605,000 T), N. N. Skripnik from the Frunze mine administration (526,400 T with commitment of 515,000 T), A. Ya. Kolesnikov from the mine "Molodogvardeyskaya" (472,800 T with commitment of 467,500 T), A.D. Polishchuk from the mine "Trudovskaya" (458,100 T with a commitment of 448,700 T), V. I. Ignat'yev from the mine "Krasnolimanskaya" (388,500 T with a commitment of 376,700 T), A. A. Asyutchenko from the mine named after the newspaper "Sotsialisticheskiy Donbas" (311,300 T with a commitment of 276,600 T), G. I. Motsak from the Kosmonavty mine (286,400 T with commitment of 258,900 T), G. G. Avraimov from the RKKA mine (237,900 T with commitment of 235,100 T); the drilling collectives of D. G. Khomich (mine "Chervona zirka"), V. G. Vendilovich (Abakumov mine), I. M. Naumov (mine administration "Znamya kommunizma"), V. M. Vernigorov (mine "Pavlogradskaya"), and others.

The planned volume of state capital investments was assimilated on the whole for the Ukrainian SSR Ministry of the Coal Industry by 97%, including the plan for construction-installation work by 96%. For the facilities of production purpose the plan for assimilation of capital investments was fulfilled by 99%, including the plan for construction-installation work by 98%.

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BRIEFS

KOLYMA HYDROELECTRIC POWER STATION--Sinegor'ye, Magadanskaya Oblast. A man-made sea is being born at the Kolyma's cascades, and filling of the Kolymskaya GES's reservoir has begun. Mighty gates have partitioned off the artificial riverbed into which the river's waters were diverted after the gates' closing, a bit less than a month ago. During this time the hydraulic-structures builders built up the dam considerably--it has reached heights that will enable the reservoir's level at the structure to be raised to 40 meters, which is necessary for startup of the first GES unit in December. After the reservoir is completely full, it will be 110 meters deep, and the water's surface will stretch for 120 km toward the river's reaches. Instruments that were installed on the summits and slopes of the cone-shaped hills will trace the effect of the reservoir on the environment. [Text] [Moscow IZVESTIYA in Russian 19 Oct 80 p 1] 11409

TOMSK OILFIELD TOOLS--Tomsk. Deep Paleozoic fields have gladdened Tomsk geologists with the first oil gushers. It is unusually difficult to study them. The equipment used here does not enable rock samples to be brought up from depths of 3.5-4 km. Also, drilling speed is reduced in the limestone. Scientists of the All-Union Scientific-Research Institute for Drilling Equipment came to the geologists' help. They proposed tooling for withdrawing a core and bits of their own design. "The innovations have proved themselves well," says V. Lychev, chief engineer of Tomskneftegeologiya[Tomsk Oil Geology Association]. "Drilling speed has increased by almost a half, and we are getting almost three times as many rock samples. We add that the economic effectiveness from use of the new bits will be more than 400,000 rubles just for the one association. Still another of the institute's developments has proved itself--a tool for generating elastic oscillations in the hole. It will enable complications that arise during drilling to be quickly eliminated. Tomsk geological expeditions are being equipped with these tools." [Text] [Moscow IZVESTIYA in Russian 19 Oct 80 p 3] 11409

TAJIK BAKED-ANODE OUTPUT--Tursunzade, Tajik SSR. The state commission has signed the document of acceptance for permanent operation of the latest line for the production of baked anodes at the Tajik Aluminum Plant. Builders of Tadzhikgidroenergostroy [Trust for the Construction of Hydroelectric Facilities in the Tajik SSR], in collaboration with installers of USSR Minenergo [Ministry of Power and Electrification] organizations, have created the country's first complex for output of this type, by means of which the technology for smelting metal is basically changed. At a vast site near the electrolysis production, "plant within a plant" has risen up--several frameworks of buildings supplied with complicated equipment. The whole technological process at the complex has been

mechanized. "Our electrode industry," says aluminum plant director S. Makhkambayev, "still is using the self-baking small-size anodes. The production facility that has been built is a significant step forward. A basically new method for vibration pressworking has been introduced. The large-size baked anodes that are being produced here will promote a sharp increase in the production of high-grade aluminum and working conditions in the electrolysis buildings will be improved." Domestic anodes were used here for smelting metal for the first time in January 1978 with the startup of the first line of the complex. The plant has now converted completely to use of its own anodes. Moreover, the enterprise will be a singular laboratory for working out technology for the output of anodes made of various types of raw material. [Text] [Moscow PRAVDA in Russian 15 Oct 80 p 1] 11409

PIPELINE CONSTRUCTION PROGRESS--The largest oil pipeline in the Caspian, which connects the pile-type Neftyanyye Kamni oilfield with the continent, has reached Zhiloy Island. The builders have laid half of the 62-km route that separates the offshore oilworkers' town from the continent. Tyumen' gas has arrived at Novosibirsk. About 70 million tons of Tyumen' gas will arrive over the Yurga-Novosibirsk gas pipeline by the end of the year. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 80 p 3] 11409

CASPIAN SEA OIL PIPELINE--Baku, 3 Sep 80 (TASS). The largest oil pipeline in the Caspian Sea, which connects the pile-type Neftyanyye Kamni oilfield with the continent, reached Zhiloy Island today. The laying of half of the 62 km route that separates the offshore oilworkers' town from the continent has been completed. The builders' collective had to surmount serious difficulties associated with strong underwater currents and complicated bottom relief. A high degree of mechanization of all operations was provided by the floating pipelinelayer "Suleyman Vezirov." Pipes were welded aboard it in lengths, and these were examined with X-rays by a special X-ray installation, which greatly speeded up laying of the pipeline on the bottom and enabled the work to be completed ahead of schedule. Next year, when the whole route will be turned over for operation, the whole flotilla of tankers that have been hauling oil from the island oilfield to the mainland will be released. [Text] [Moscow PRAVDA in Russian 4 Sep 80 p 2] 11409

SUPERHIGH-VOLTAGE POWER LINES--Leningrad. The collective of the Department of Electrical Equipment of Leningrad Polytechnical Institute imeni M. I. Kalinin, under the guidance of Professor, Doctor of Engineering Sciences G. Aleksandrov, is engaged in problems of creating high-tension electric-power lines of 1.15 and 1.8 million volts. These lines will reduce losses, increase transmission distance, and help to solve some of the complicated tasks of transmitting electricity over great distances, from giant Siberian electric-power stations and high-capacity AES's to the country's Unified Power System. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 80 p 13] 11409

FAR EASTERN POWER LINE--A new shockwork construction site--an electrical transmission line of 500 kw [sic]--was recently started in the Maritime District. A number of industrial enterprises, design institutes and construction trusts are participating in the laying of the LEP [electric-power transmission line] from Luchegorsk to the "Dal'nevostochnaya" [Far Eastern] substation. [Excerpts] [Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 80 p 16] 11409

PREWINTER POWER-STATION STATUS--Donetsk. It is a feverish time at the Donbass's electric-power stations now. At the Uglegorskaya GRES, the largest, medium-level and current repair of equipment have been completed. By 15 October, equipment of the second boiler-and-turbine department will have been overhauled. The picture is different at the Starobeshevskaya GRES. Out of 130 organizational and technical measures, only 47 had been implemented on the day that people's control was there to make a check. The cartippers still had not been put in order. The fourth power unit stopped seven times in one month after overhaul. GRES Director Yu. Gusev gives assurances that all the equipment will be repaired in the near future, but the pace of preparation for winter remains inadequate. The poor quality of the coal that arrives worries the power workers of these and other Donbass electric-power stations. The fuel-transport department of the Starobeshevskaya GRES accepted in our presence a routine unit train that had been dispatched from the Torez and Donetsk central coal-preparation plants. The coal was too moist and lumpy. A peculiar exhibition has been set up at the power station's board. Among its exhibits are lengths of wire, metal, clay, boards and other trash that has fallen into the coal. The ash content is high. Many complaints have been filed against the Kiselevka and Snezhnyansk coal-preparation plants. UkSSR Minugleprom [Ministry of Coal Industry] had been required to take all measures to see to it that, on the threshold of winter, electric-power stations will be supplied with an adequate amount of fuel of the required quality. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 80 p 3] 11409

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